

IUBMB Enzyme Nomenclature

EC 1.1.1.158

Common name: UDP-*N*-acetylmuramate dehydrogenase

Reaction: UDP-*N*-acetylmuramate + NADP⁺ = UDP-*N*-acetyl-3-*O*-(1-carboxyvinyl)-D-glucosamine + NADPH + H⁺

For diagram [click here](#).

Other name(s): MurB reductase; UDP-*N*-acetylenolpyruvoylglucosamine reductase; UDP-*N*-acetylglucosamine-enolpyruvate reductase; UDP-GlcNAc-enolpyruvate reductase; uridine diphosphoacetylpyruvoylglucosamine reductase; uridine diphospho-*N*-acetylglucosamine-enolpyruvate reductase; uridine-5'-diphospho-*N*-acetyl-2-amino-2-deoxy-3-*O*-lactylglucose:NADP-oxidoreductase

Systematic name: UDP-*N*-acetylmuramate:NADP⁺ oxidoreductase

Comments: A flavoprotein (FAD). Sodium dithionite, sodium borohydride and, to a lesser extent, NADH, can replace NADPH.

Links to other databases: [BRENDA](#), [EXPASY](#), [KEGG](#), [ERGO](#), [PDR](#) CAS registry number: 39307-28-3

References:

1. Taku, A. and Anwar, R.A. Biosynthesis of uridine diphospho-*N*-acetylmuramic acid. IV. Activation of uridine diphospho-*N*-acetylenolpyruvoylglucosamine reductase by monovalent cations. *J. Biol. Chem.* 248 (1973) 4971-1976. [PMID: [4717533](#)]
2. Taku, A., Gunetileke, K.G. and Anwar, R.A. Biosynthesis of uridine diphospho-*N*-acetylmuramic acid. 3. Purification and properties of uridine diphospho-*N*-acetylenolpyruvyl-glucosamine reductase. *J. Biol. Chem.* 245 (1970) 5012-5016. [Medline UI: [4394163](#)]
3. van Heijenoort, J. Recent advances in the formation of the bacterial peptidoglycan monomer unit. *Nat. Prod. Rep.* 18 (2001) 503-519. [PMID: [11699883](#)]

[EC 1.1.1.158 created 1976, modified 1983, modified 2002]

[Return to EC 1.1.1 home page](#)

[Return to EC 1.1 home page](#)

[Return to EC 1 home page](#)

[Return to Enzymes home page](#)

[Return to IUBMB Biochemical Nomenclature home page](#)

SRNT INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/21432

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12N15/53 C12N9/04 C12Q1/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, STRAND

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 899 335 A (SMITHKLINE BEECHAM PLC ; SMITHKLINE BEECHAM CORP (US)) 3 March 1999 (1999-03-03)	1-20, 48-53
Y	the whole document	21-43, 47
A	----- BENSON TIMOTHY E ET AL: "The structure of the substrate-free form of MurB, an essential enzyme for the synthesis of bacterial cell walls." STRUCTURE (LONDON), vol. 4, no. 1, 1996, pages 47-54, XP000960650 ISSN: 0969-2126	1-20, 48-53
Y	cited in the application the whole document	21-43, 47
	----- -/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

15 November 2000

Date of mailing of the international search report

28/11/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Van der Schaal, C

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/21432

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	BENSON TIMOTHY E ET AL: "Crystallization and preliminary X-ray crystallographic studies of UDP-N-acetylenolpyruvylglucosamine reductase." PROTEIN SCIENCE, vol. 3, no. 7, 1994, pages 1125-1127, XP000960611 ISSN: 0961-8368	1-20, 48-53
Y	the whole document	21-43, 47
Y	DATABASE BIOSIS 'Online! BIOSCIENCES INFORMATION SERVICE, PHILADELPHIA, PA, US; 20 May 1999 (1999-05-20) KIYAMA RYUICHI ET AL: "Homology modeling of gelatinase catalytic domains and docking simulations of novel sulfonamide inhibitors." Database accession no. PREV199900404023 XP002152652 abstract & JOURNAL OF MEDICINAL CHEMISTRY, vol. 42, no. 10, 20 May 1999 (1999-05-20), pages 1723-1738, ISSN: 0022-2623	21, 22
Y	CHAMBERLAIN DEAN ET AL: "Possible arrangement of the five domains in human complement factor I as determined by a combination of X-ray and neutron scattering and homology modeling." BIOCHEMISTRY, vol. 37, no. 40, 6 October 1998 (1998-10-06), pages 13918-13929, XP002152650 ISSN: 0006-2960 the whole document	21, 22
Y	KUNTZ I D ET AL: "STRUCTURE-BASED MOLECULAR DESIGN" ACCOUNTS OF CHEMICAL RESEARCH, US, AMERICAN CHEMICAL SOCIETY, WASHINGTON, vol. 27, no. 5, May 1994 (1994-05), pages 117-123, XP000885741 ISSN: 0001-4842 the whole document	23-43
Y	GSCHWEND D A ET AL: "MOLECULAR DOCKING TOWARDS DRUG DISCOVERY" JOURNAL OF MOLECULAR RECOGNITION, GB, HEYDEN & SON LTD., LONDON, vol. 9, 1996, pages 175-186, XP000882526 ISSN: 0952-3499 the whole document	23-43
	-/-	

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/21432

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>DATABASE BIOSIS 'Online! BIOSCIENCES INFORMATION SERVICE, PHILADELPHIA, PA, US; 1992 RAY W J JR: "EFFECT OF POLYETHYLENE GLYCOL-400 AT LOW CONCENTRATIONS ON LONG-TERM GROWTH OF MUSCLE PHOSPHOGLUCOMUTASE CRYSTALS FROM CONCENTRATED SALT SOLUTIONS" Database accession no. PREV199294119155 XP002152653 abstract & PROTEINS STRUCTURE FUNCTION AND GENETICS, vol. 14, no. 2, 1992, pages 300-308, ISSN: 0887-3585</p>	47
Y	<p>DATABASE BIOSIS 'Online! BIOSCIENCES INFORMATION SERVICE, PHILADELPHIA, PA, US; 1996 ZHANG ERLI ET AL: "Crystallization and initial spectroscopic characterization of the heme-containing dehaloperoxidase from the marine polychaete Amphitrite ornata." Database accession no. PREV199799333346 XP002152654 abstract & ACTA CRYSTALLOGRAPHICA SECTION D BIOLOGICAL CRYSTALLOGRAPHY, vol. 52, no. 6, 1996, pages 1191-1193, ISSN: 0907-4449</p>	47
Y	<p>DATABASE BIOSIS 'Online! BIOSCIENCES INFORMATION SERVICE, PHILADELPHIA, PA, US; 30 March 1998 (1998-03-30) WIKOFF WILLIAM R ET AL: "Crystallization and preliminary X-ray analysis of the dsDNA bacteriophage HK97 mature empty capsid." Database accession no. PREV199800210998 XP002152655 abstract & VIROLOGY, vol. 243, no. 1, 30 March 1998 (1998-03-30), pages 113-118, ISSN: 0042-6822</p>	47